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A microstrip photonic crystal with bandgap tuning using laser-produced plasmas. BENJAMIN WANG, MARK CAPPELLI, Stanford University — A tunable microstrip bandgap device with plasma elements is designed and experimentally characterized. A straight microstrip waveguide with patterned holes in the copper ground plane form a photonic bandgap structure, with an operating frequency of 2 GHz – 12 GHz. Various configurations of the microstrip allow for bending and switching, with addition of tunable elements for active tunability. ANSYS HFSS simulations were performed to characterize the transmission characteristics of the device. A switchable plasma element is integrated into the holes in the ground plane using a pulsed laser generated plasma, allowing for active tunability of attenuation and switching of the device. The plasma element in the ground plane bandgap structure allows the transmission in the bandgap frequencies to be tuned as a function of plasma density.

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